STAT 5401 Spring 2019

Applied Multivariate Methods

University of Minnesota – Twin Cities

Instructor and TA Information

Instructor:	Kean Ming Tan	TA:	Mingyang Liu
Email:	ktan@umn.edu	Email:	liux3941@umn.edu
Office:	Ford Hall 357	Office:	To be determined
Office Hours:	4:00-5:00pm M	Hours:	To be determined

Course Information

Time:	MWF 11:15am–12:05pm
Location:	Rapson Hall 45
Description:	You will learn when and how to apply popular multivariate methods, e.g., multivariate normal distribution, multivariate linear regression, principal components analysis, factor analysis, canonical correlations, discrimination and classification, clustering, and graphical modeling. We will also briefly cover topics on neural network and deep learning if time permits.
Required:	Official course prerequisites are STAT 5302 or STAT 8102.
Suggested:	MATH 2243 (preferably MATH 4242). This course requires familiarity with linear algebra. If you have not had linear algebra, proceed at your own risk.

Course Materials

Textbooks:	*Applied Multivariate Statistical Analysis, 6th* (Johnson & Wichern, 2007)
Software:	*R version 3.5.2* (available for free at http://www.r-project.org/)
Notes:	Lecture slides will be posted to the course website before class. I strongly encourage you to bring a copy of the slides to the lecture.

Grading

Homework:	25 points	(5 points each)
Midterm I:	25 points	(this will be an in class exam)
Midterm II:	25 points	(this will be a take home exam)
Final Project:	25 points	(this will be a group project)

A	B	C	D	F
90-100%	80-90%	70-80%	60-70%	<60%

Note: +/− will be added as appropriate.

Homework

Overview: Assignments will require you to write R code, analyze real data, and **clearly** summarize your results. Practically speaking, you should organize your solutions such that they can be easily located to their corresponding questions.

Submission: Your answers and the associated R code should be submitted in the beginning of class. In an emergency, assignments can be emailed to the TA (in pdf).

Policy: **Assignments are due in the beginning of class on the due date. Late submissions and resubmissions will not be accepted. You may discuss the homework problems but you should write up the solution independently.**

Midterm I (in class)

Overview: This in class midterm exam will include materials from the first 3–4 weeks of classes.

Policy: **There will be no make-up exam without a documented, legitimate reason that is outside of your control. Social conflicts or a heavy workload are unacceptable excuses.**

Midterm II (take home)

OVERVIEW: A longer and more in-depth assignment that will require you to conduct a comprehensive analysis and report on interesting data.

SUBMISSION: Same as submission of homework assignments.

POLICY: **The midterm will be due in the beginning of class on the due date. Late submission and resubmissions will not be accepted. You MAY NOT collaborate on the take home midterm exam. You will receive a 0 in the take home midterm exam if the instructor/TA finds out that you participate in any form of collaboration. Academic misconduct will be reported to the Office of Student Conduct and Academic Integrity.**

Final Project

OVERVIEW: Towards the end of the semester, you will complete a final project with a group of 3–5 students. You will use tools you learn from the class (or outside the class) to perform a comprehensive data analysis on an interesting data set of your choice. During the last week of the class, you will be asked to present your work. You will be evaluated on your work, clarity in the final report, as well as presentation skills.

SUBMISSION: Submit your final report and its associated R code to the instructor's mailbox.

POLICY: **The final report is due last day of class. Late submission and resubmissions will not be accepted.**

Miscellaneous

INTEGRITY: Students must abide by the campus regulations and student conduct code; see http://regents.umn.edu/policies/index

DISABILITY: Students with disabilities requiring accommodations should contact the instructor as soon as possible; see https://diversity.umn.edu/disability/.

STRESS: UMN provides services for you to help manage your mental health and stress levels; see http://www.mentalhealth.umn.edu.

CHANGES: The content and requirements of this course and syllabus may be altered depending on the instructor's perception of the needs of the class. *See the course website for the current version of the course syllabus and schedule.*

Academic Honesty and Dishonesty

The following definition of student academic integrity and scholastic dishonesty is slightly modified from the webpage of the University's Office for Student Conduct and Academic Integrity, http://www.oscai.umn.edu:

Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis.

All School of Statistics teaching faculty are instructed to refer students who violate the policy for academic honesty and dishonesty to the Office of Student Conduct and Academic Integrity. A student responsible for scholastic dishonesty can in addition be assigned a penalty up to and including an F or N for the course.

Recommendation Letter Policy

As a general policy, the instructor *does not* write recommendation letters for any students who are currently enrolled in his course(s). Once you have completed the instructor's course (and your final grade is available), it is acceptable to ask for a recommendation letter.

However, it is best to obtain recommendation letters from faculty members that you have worked with outside of a classroom setting, e.g., as a research assistant. If you do not have any non-classroom interaction with the instructor and/or have not been an active participant in this course, the instructor will not be able to write you a strong recommendation letter.